

5th Grade

Unit 1

Adapted from [Progressions](#) from Tools for the Common Core Standards

Content Standards, Rationale, and Strategies

5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5.OA.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.

Rationale

Students should be given ample opportunities to explore numerical expressions with mixed operations. They write expressions to express a calculation, e.g., writing $2 \times (8 + 7)$ to express the calculation “add 8 and 7, then multiply by 2.”, in other words, literacy in mathematics. Another example: Are students able to interpret and evaluate expressions, e.g., using their conceptual understanding of multiplication to interpret $3 \times (18932 + 921)$ as being three times as large as $18932 + 921$, without having to calculate the indicated sum or product? This knowledge will prefigure later with variable expression such as three times an unknown length which is written $3 \cdot L$ (*scaling*). This work in grade five is viewed as exploratory rather than for attaining mastery so expressions should not be more complex than expressions they will use with the application of the associative or distributive property, e.g., $(8 + 27) + 2$ or $(6 \times 30) + (6 \times 7)$.

Strategies

Begin with expressions that have two operations without any grouping symbols (multiplication or division combined with addition or subtraction) before introducing expressions with multiple operations. Using the same digits, with the operations in a different order, have students evaluate the expressions and discuss why the value of the expression is different. For example, have students evaluate $5 \times 3 + 6$ and $5 + 3 \times 6$. Discuss the conventions for parentheses and how and why they are used. Use activities like *How Many Dots* to have students understand why groups have to be computed first. They also need to interpret an expression without evaluating (solving like an equation).